THE NATIONAL GEOGRAPHIC MAGAZINE

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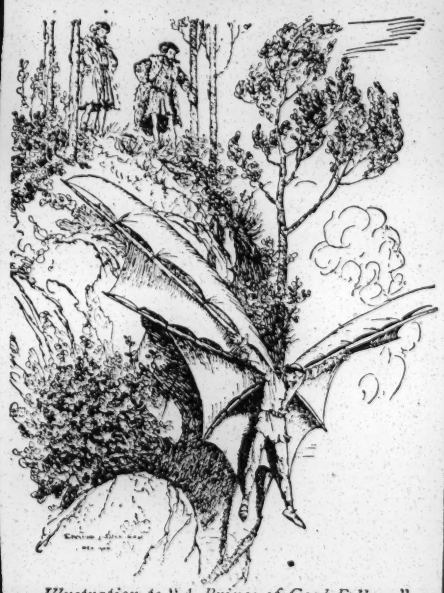

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THE NATIONAL GEOGRAPHIC MAGAZINE

RECENT EXPLORATION IN THE CANADIAN ROCKIES

BY WALTER D. WILCOX

BETWEEN the United States boundary and the Canadian Pacific Railroad lies a part of the Rocky Mountains which remains unexplored. Captain Palliser, searching for a pass across the Rockies, went through the northern part of this region half a century ago, but traveled so rapidly that his notes, even on the part he visited, have almost no geographic value. This large area, which is a blank on Dawson's map, represents more than 2,000 square miles in the main range of the Rockies. Many tributaries of the Elk and Kootenai Rivers rise in this unknown region. Of these the Bull River, a torrent too wild to be crossed on a raft and too deep to ford with horses, descends from the southern part, its canyons and timber-choked valley having defied every attempt to find its source.

Last summer Mr. Henry G. Bryant and the writer made an expedition with the purpose of exploring this region. We planned also to make on our way south an ascent of Mt. Assiniboine, a conspicuous and superb peak of the main range. In the latter attempt we were defeated. One of our Swiss guides was bucked off a pony and his arm dislocated on the way to the mountain's base, and we had the further misfortune of three days' stormy weather, which covered the mountain with snow. We, however, reached a point 11,000 feet above sea-level on its southern slopes, where we were compelled to turn back by avalanches falling continuously on every side.

Four days later we reached our main camp, near the forks of the Spray River, 20 miles south of Banff. Here we dismissed the two Swiss guides, and gave them saddle horses and escort of one of our men to a point within walking distance of the railroad. The two other men were sent to cut out the trail for the first day's march.

A description of our outfit and general plan is here advisable. Our Indian ponies—fourteen in number—two tents and Indian teepee, with sufficient provisions for a long and hard journey, were supplied at Banff by T. E. Wilson. Our men were Tom Lusk, James Wood, and Ben. Woodworth, the two former serving as packers and the latter as cook.

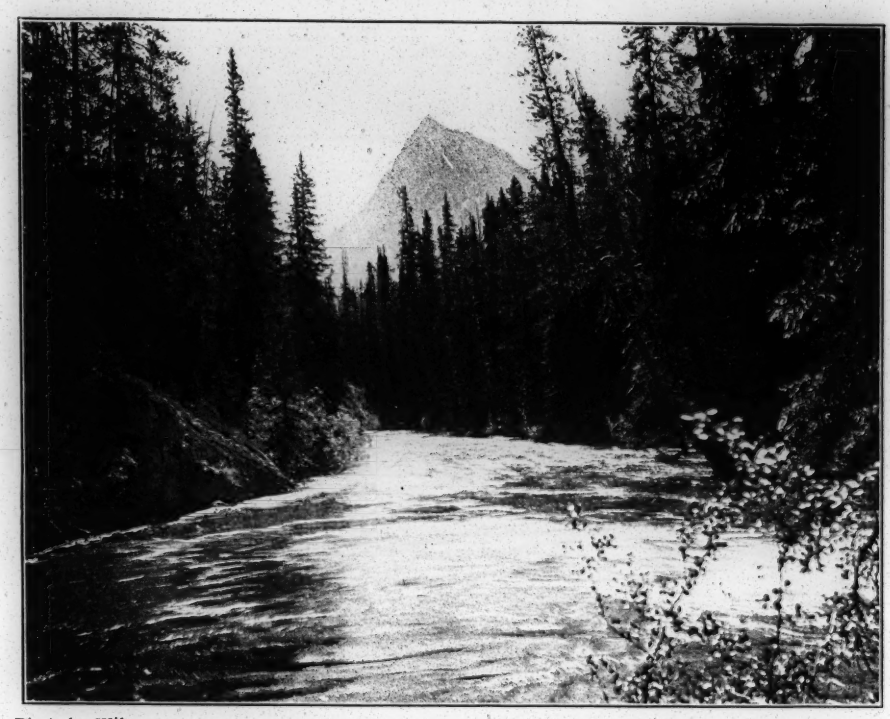


Photo by Wilcox

Spray River near the Forks

No better selection of men could have been made. Each could serve well in the capacity of cook, packer, or axeman. Subsequent success was partly due to completeness of equipment and the efficiency of our men.

Our general plan of exploration was to proceed directly south from the White Man's Pass and make the Kananaskis Lakes our first headquarters. It was then our idea to follow the Elk River southwards and explore the unknown streams which come out of the high range of mountains on its west side. Circumstances entirely changed this order of travel and added a decided interest to our movements without in any way defeating geographical work.

Our scientific equipment was simple. It consisted of a prismatic compass and Abney's level, two aneroid barometers, thermometer, and three excellent cameras for tripod work, panoramas, and snap shots. We also carried a King folding boat for exploring the Kananaskis Lakes and crossing rivers.

No weather could have been more perfect than that of August 4, the day after our guides were sent back and we were to set out for the unknown south land. The sky was perfectly clear and the mountain air invigorating as we commenced marching. Two branches of the Spray River run north into the great transverse rift called the White Man's Pass, and of these we chose to ascend the more westerly, as it was not mapped and would lead us at once into unexplored territory. On Dawson's map this valley bears the words "trail to the Kananaskis Lakes." We set out with full assurance that in four days at most we should reach these lakes, and in an hour had left the

main valley and turned sharply to the southeast. A good Indian trail led us through deep spruce woods for two miles and then entered a very beautiful valley. The lower levels are too wet for forest growth, so that splendid views were to be enjoyed in every direction. The mountains on the east are from eight to nine thousand feet high, with very rough outlines and vertical precipices toward the north. Those on the other side are higher and have small glaciers on their upper parts. The wooded slopes and open glades of the valley, thick with clumps of dwarf birch and willow, together with the winding and picturesque stream, made our introduction to the new region most inviting.

About one o'clock a valley opened to the south which seemed worthy of exploration, and we accordingly made camp on a wooded ridge between the confluent streams. Later in the day Bryant and I started on foot to investigate this opening. The small size of the stream indicated a summit or pass not far distant. We found the walking very rough over a succession of small, wall-like ridges covered with thick woods and charming meadows between crowded with wild flowers. A foamy stream led us to a green pool, the upper end of which was overhung by vertical cliffs of limestone. These cliffs made the end of a small canyon, which led us in half a mile to a blue-green lake three-fourths of a mile long. This we decided to skirt, fortunately by the right shore, where we soon found a good Indian trail which traversed the steep, open slopes above the lake, covered with mountain flowers in the height of perfection. A rank growth of false hellebore and cow parsnip rose above

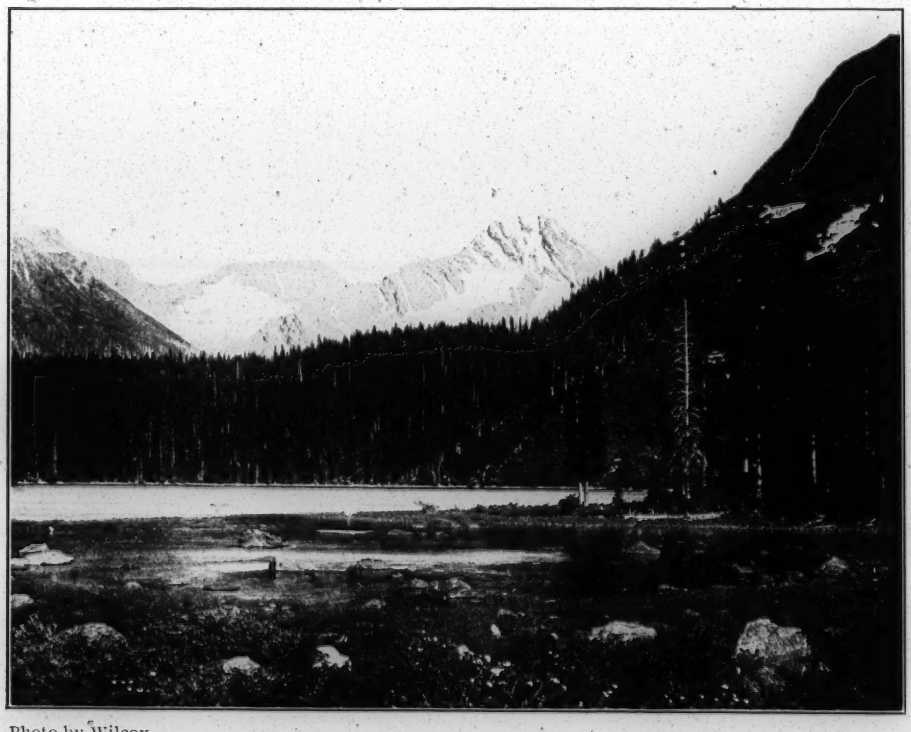


Photo by Wilcox

Canyon Lake

our heads, while the ground was concealed by beautiful asters, white geraniums, meadow rue, and forget-me-nots. In contrast to this picture of summer, one cove of the lake was filled by a snow bank at the water's edge, remaining unmelted from the previous winter.

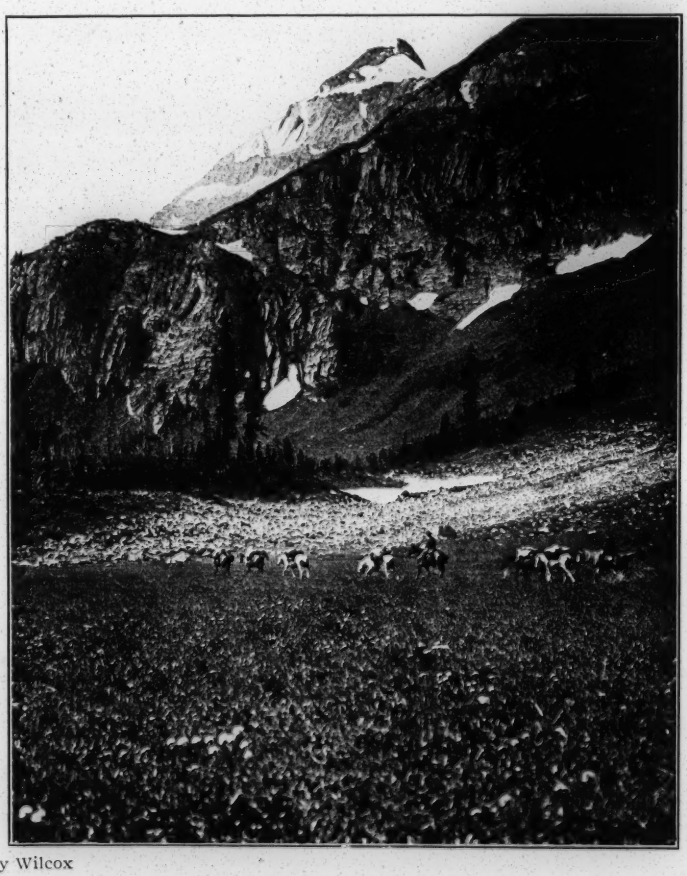


Photo by Wilcox

"We continued our march up the main valley"

The upper end of this lake is dotted with small islands. An open glade extends to the summit of a pass not half a mile distant. It is 6,100 feet above sea-level—very little higher than the lake. Descending a short distance we saw a green valley running almost due south into the heart of an unknown country, which should prove an interesting point of departure for some future exploration. This pass is on the continental watershed, and hence on the boundary between the Northwest Territories and British Columbia. An unusually gentle ascent makes the approach easy from the east, and the trail indicates that the Indians have used this as a route to the Kootenai. The pass is 600 feet lower than the height accredited by Dawson to the White Man's Pass, which lies five or six miles farther north.

The remarkable feature of the lake

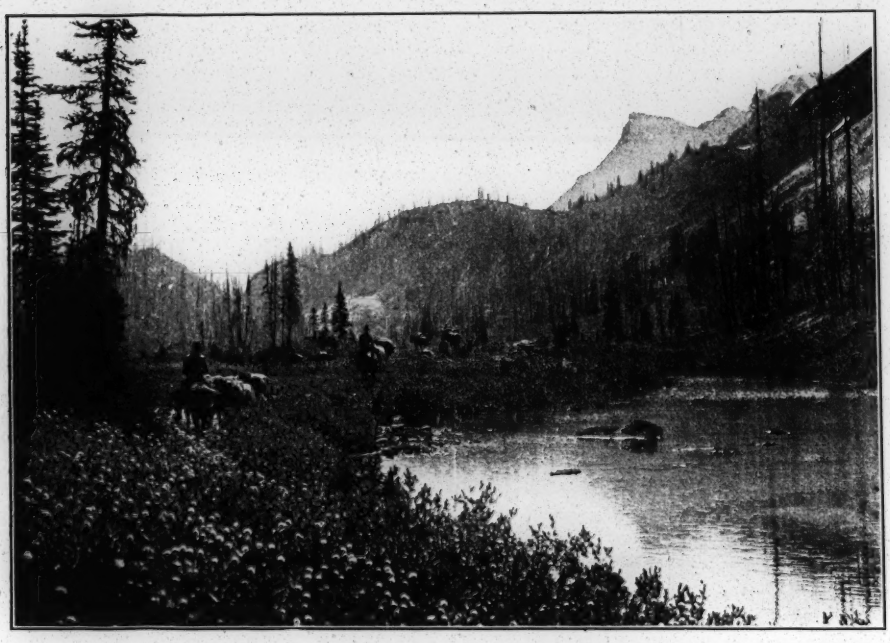


Photo by Wilcox

Approaching a Rough Country

near this pass is that there is no apparent outlet into either valley. The narrow canyon, now partly filled with large masses of rock from its own walls, gives without doubt an underground passage for the water, but it would be hard to explain how the water first cut through a high ridge when the drainage seems more natural in the other direction.

We continued our march up the main valley next day. An early start was made on account of the "bulldogs," a kind of horsefly, which were remarkably numerous in this picturesque and interesting valley. They are most numerous on hot, sunshiny days, but fortunately do not appear till several hours after sunrise. Their bite is like a fiery spark, which drives horses frantic, so that it is almost impossible to pack them after these ferocious pests have made their appearance in force.

An Indian trail ascends the main valley through a quite level country with sharp peaks on every side. The most imposing lies to the southeast, and appears nearly 11,000 feet high. Toward this we marched at three miles an hour, the maximum rate for a heavy pack-train. A sudden termination to easy progress and pleasant surroundings came at length near the valley end, where a sharp ascent through burned timber brought us, at 11 o'clock, to the pass summit, 6,690 feet above sea-level. The summit is nearly level for about two miles, and dotted with several shallow lakes of marvelous colors. The encircling mountains, with their glaciers and waterfalls, made the scenery interesting, but we were disappointed to catch glimpses of a desolate, burned valley ahead which looked very rough. We were forced to make several exceedingly steep descents into this new valley, which runs southeast, and which we thought was the Kananaskis. Our pack animals showed great skill in jumping logs and

selecting safe routes, and after six hours of hard work camp was made near a large stream which enters from the east. The altitude here was 4,980 feet, considerably below Dawson's estimate for the Kananaskis Lakes, a fact that made us first suspect that we were not in the Kananaskis Valley. The tents stood on a former Indian camping ground, and in fact our men used their poles to stretch the teepee. At this place we overlooked a trail of great importance. The narrow and wild valley opposite our camp, with its muddy torrent, which indicated a glacial source, seemed a most unlikely place for an Indian trail. Moreover, the vast multitude of logs and the rank growth of false hellebore, standing seven or eight feet high, and other weeds, sufficiently disguised the already faint trails and led to a complete change in all our subsequent movements.

Though the weather remained clear a strong wind swept clouds of smoke from forest fires into the valley and added to the dreary aspect of our surroundings. However, a slight change in the direction of the wind during the night moved the smoke clouds a great distance to the south and proved that the fire was not nearer than the Kootenai Valley or Selkirk Range.

The march next day developed no change until after about five miles of very rough country had been covered. A large stream then came in from the west, and the valley is wider, with open gravel beds for many miles. We had now given up the idea of finding the Kananaskis Lakes in this valley, which we thought must be that of the Palliser or some tributary thereto. Steady progress was made by marching over the waterworn stones, which were very trying to our ponies, and fording the river constantly. Meanwhile a constant outlook was kept for some opening on our left that might be the Kananaskis Pass. Nothing appeared till about noon, when a gap was disclosed in the hitherto unbroken range of mountains to the east. As we drew nearer, the gap seemed to close again, and a more promising opening was seen about three miles down the valley. We had, however, already come too far south, and it seemed best to camp here and investigate. Though there was not much grass for our horses, a partial compensation was felt in the almost total absence of the bulldog flies which had made the charming country near the source of the Spray River almost unendurable, and there was, as is almost universally true in the Canadian Rockies, an abundance of firewood and excellent water for our camp. Proof that the country abounded in game was given by the presence of wooden frames used by the Indians for scraping and drying the hides of mountain goats and other animals.

The afternoon was spent in a general reconnaissance. Tom Lusk was sent downstream to investigate the first valley on the east. Meanwhile Bryant and I made a direct line through the woods toward the gap which we had seen. We soon came to a canyon and a large stream, which descends from a green valley above. A steep mountain of moderate height appeared ahead, and I proposed to climb it to get a better view of the surrounding region, but Bryant did not think it worth while, and turned back. In an hour I reached 5,700 feet, but could not safely go farther on the almost precipitous limestone cliffs. I got a fine view and made a sketch of a promising green valley which runs south and ends in some high red hills.

As no trail had been discovered in the canyon, we felt confident that Lusk's trip would give better results. He returned later, however, and reported that there was no evidence of a trail in the first valley on the east, and that it seemed quite impassable for horses. This was our first geographical problem. To follow the uninteresting Palliser River farther seemed fruitless, as it was

now bending away toward the west and becoming so large as to give us trouble in fording it. After some discussion a decision was reached to spend the following day in a more thorough reconnaissance.

August 7, like every day of our trip so far, was almost perfect. Lusk and Wood were sent down the river to explore as far as the second or third valley openings, while Bryant and I decided to ascend the canyon near our camp and

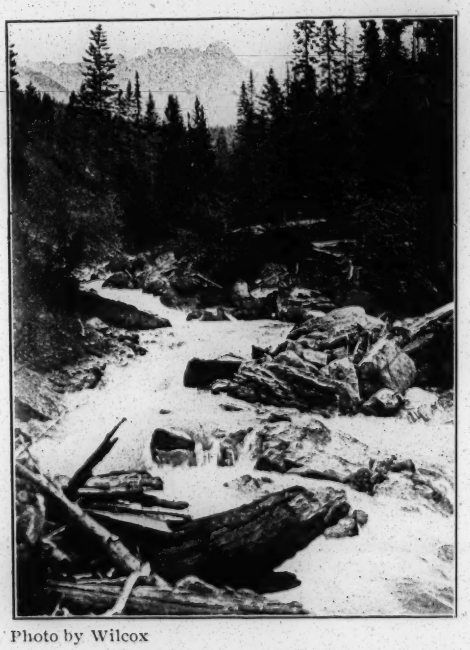


Photo by Wilcox

A Torrential Stream

climb some high mountain, if accessible. Upon entering the canyon we made slow progress among great boulders and tree trunks strewn in wild disorder on either side of a torrential stream, which was little less than a series of cascades. At length the canyon walls forbade farther progress on our side and we were forced to find a way to cross the stream. Fortunately some massive spruce trees had been jammed by a former flood among the boulders on either side and made a kind of natural bridge not far ahead. Crossing on these, we had gone but a few steps when we came most unexpectedly on a good Indian trail. Here, then, was the Kananaskis Pass at last. So confident did we feel of being now on the right route that we should have gone back to camp at once and packed up for a day's march, except that our men were by this time several miles down the river, and the day was practically lost. It seemed best to follow the trail as far as possible and see what the day would bring forth. After ascending steeply for one thousand feet, the trail enters a virgin forest on the almost level benches of the upper valley. Only a few rays of sunlight filtered through the silent trees. These dark evergreens of Canada are scarcely inhabited by squirrels or birds, but the utter quiet of deep woods was restful after the roar of the turbulent stream we had left below.

At two o'clock we reached a point near the valley end 7,550 feet above sea-level, or nearly 3,000 feet above our camp in the Palliser. The fact that this valley runs south did not disturb our idea that it might be the Kananaskis Pass, as almost all the great passes make a series of right-angled turns through the lateral and transverse valleys of the several subranges. On Dawson's map, however, the Kananaskis Pass is given an altitude of only 6,200 feet, and as we were now 1,300 feet higher without reaching the summit, we suspected a serious error in his estimate or a mistake as to our own bearings.

In the evening our men reported that they went seven or eight miles down the river, where it became impossible to ford and the trail was obscure. No openings in the mountains that seemed possible passes appeared as far as they went. They said a wide valley comes in several miles below their turning point on the left side of the river, and

that a large, muddy stream enters on the opposite side. The latter, no doubt, comes from the glaciers of a mountain over 11,000 feet high which we had seen many times northwest of our camp.

We made an early start next day, August 8, but lost much time crossing the strip of burnt timber between our camp and the canyon. While traversing this on foot I noticed that my clothes were smeared by a syrupy substance. Upon examination I found that this came from a kind of grass resembling wild barley, the stems and beards of which were covered by a thick, viscid liquid with a sweet taste. The plants so affected were inhabited by a minute brick-red insect no larger than a pinhead. They resembled a small spider, except for two antennæ curving first backward and then recurved forward at the ends. No doubt the bites of these parasites caused the thick syrup on the grass.

With two men ahead to cut out timber, we made rapid progress through the canyon. Our pack-train made an interesting picture winding along the foamy torrent, where a rough trail had been skillfully chosen by the Indians through a maze of obstacles which, at first sight, made it difficult to believe that a passageway could be found for men, to say nothing of pack animals. Immense masses of limestone, which had fallen from the canyon walls, and the trunks of trees, swept into the gorge in time of flood, made the trail wind and turn and even cross the stream. The loud roar of falling water made it impossible to talk or even hear the blows of the axe or the shouts of our men urging on the horses. The morning air was cold in the deep shade of the canyon and a damp mist swept against our faces from the endless cascades, while far above our heads the sun could be seen shining on the green forests of the upper valley. It required nearly five hours to reach some meadows in the middle part of the valley, where we camped in a delightful spot at 5,245 feet altitude. This point was half way to where we had walked the day before.

The scenery on every side of our camp was remarkable. On the north was a high ridge, covered far above timber-line by lawny patches of green grass, looking like velvet in the distance and making a striking contrast to the bare slides of red stone between them. To the east was an impressive mountain, rising from the meadow where our camp was located, and showing the entire sweep of the 4,000 or 5,000 feet to its bare and forbidding summit. Part of its highest peak, seen in profile, overhangs its base by at least 200 feet. This entire valley is covered with green forest, a pleasing change from the desolate Palliser River.

There was a little rain in the night, but the day broke fair and colder. The upper part of the valley was reached after a march of four hours. Above timber-line the trail was lost in open country and some time was wasted in an effort to locate it. Tom Lusk and I eventually found it in the middle one of three gulches which make passes into a valley to the south. From the summit we saw a vast extent of sharp peaks and strange mountains, with a green valley between, running due south. The pass is 7,600 feet high, and as the new valley runs so far south we gave up all hope that we were either on the Kananaskis Pass or likely to reach the lakes very soon. That we were temporarily lost in the heart of an unexplored wilderness only added to the interest of our movements and the appreciation of the wonderful scenery on every side. We could always, as our men said, "hit the back trail" or possibly find a more interesting route should a pass be discovered over the ranges between us and the Elk River. Camp was made in meadows below the pass at timber-line. In the afternoon

Photo by Wilcox

"We camped in a delightful spot"

Bryant and I climbed a mountain 8,400 feet high south of our camp. From this point a fine panorama was disclosed, and even Mt. Assiniboine could be seen far to the northwest beyond the Palliser River. A very high peak lies just north of the new pass, one that had been seen for two days, and that eventually proved quite a landmark in our travels. We were glad to see that the new valley

Photo by Wilcox

"Lanes of green meadows and Alpine flowers"

running south was covered by green timber, a feature that adds very much to the interest of a country and to ease of travel. On the east side of this valley is a double range of mountains, the lower of which flanks the stream with abrupt precipices, while the higher makes a jagged line of sharp needles, now partly concealed by clouds, with their strata vertical. While we were on the summit a number of thunder-storms were sweeping over the mountains, and at length one came directly across our peak. We sought shelter from cold wind and hail among some crags just below the summit. When the storm was at its worst I noticed a curious sensation in my hair and mustache. Standing up I felt a tingling and heard a faint crackling sound. Bryant, who was quite near, said he observed nothing. However, we were almost on the summit of the mountain, and I have little doubt but that during the storm a large amount of electricity was passing between the clouds overhead and our peak, as there was frequent lightning and heavy thunder on every side.

The weather cleared in the evening and became colder. We were camped at tree-line, which in this part of the Rockies varies between 7,000 and 7,500 feet. Our camp was in open country intersected by long ridges of red stone,

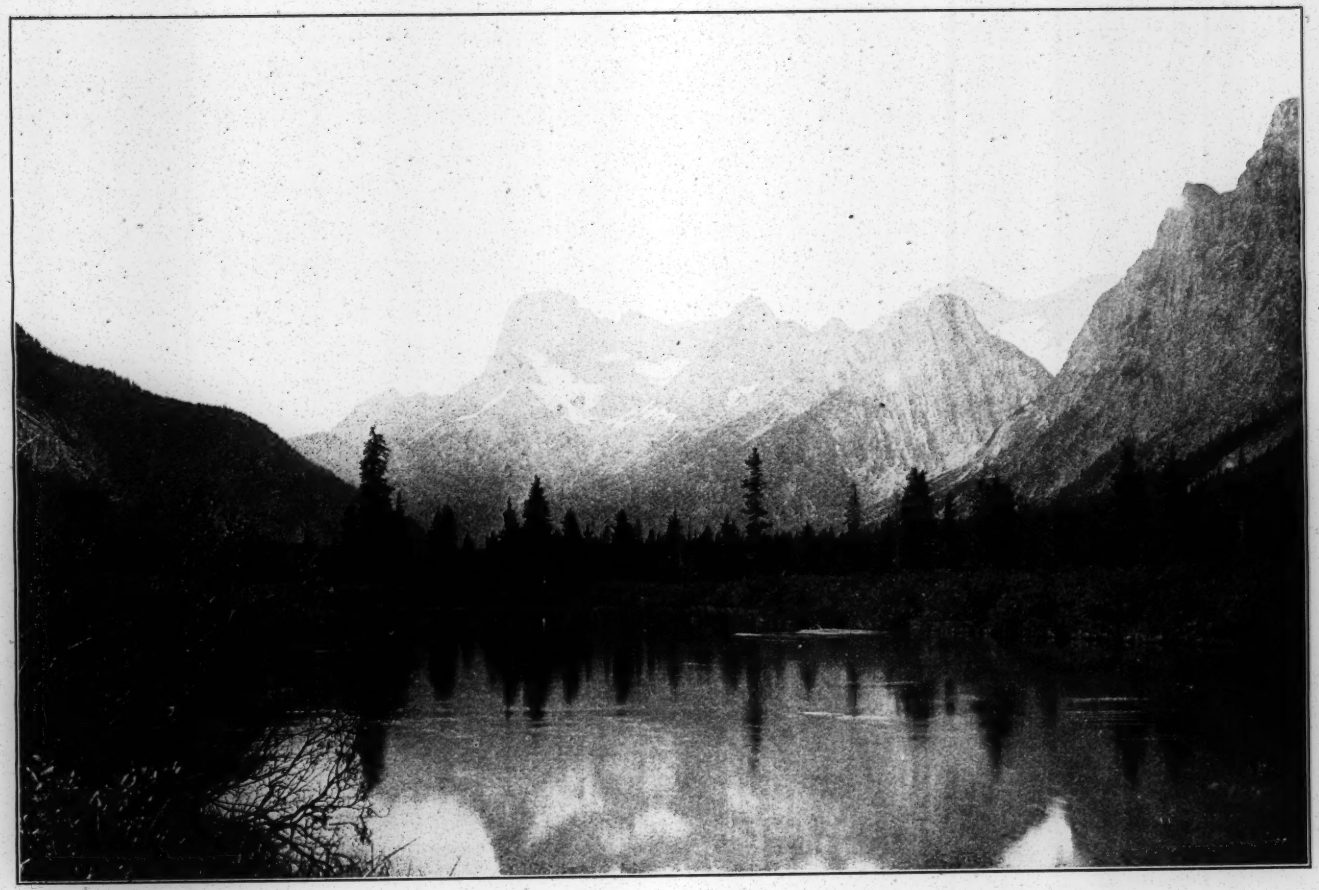


Photo by Wilcox

"A long sweep of the river and a distant snow peak"

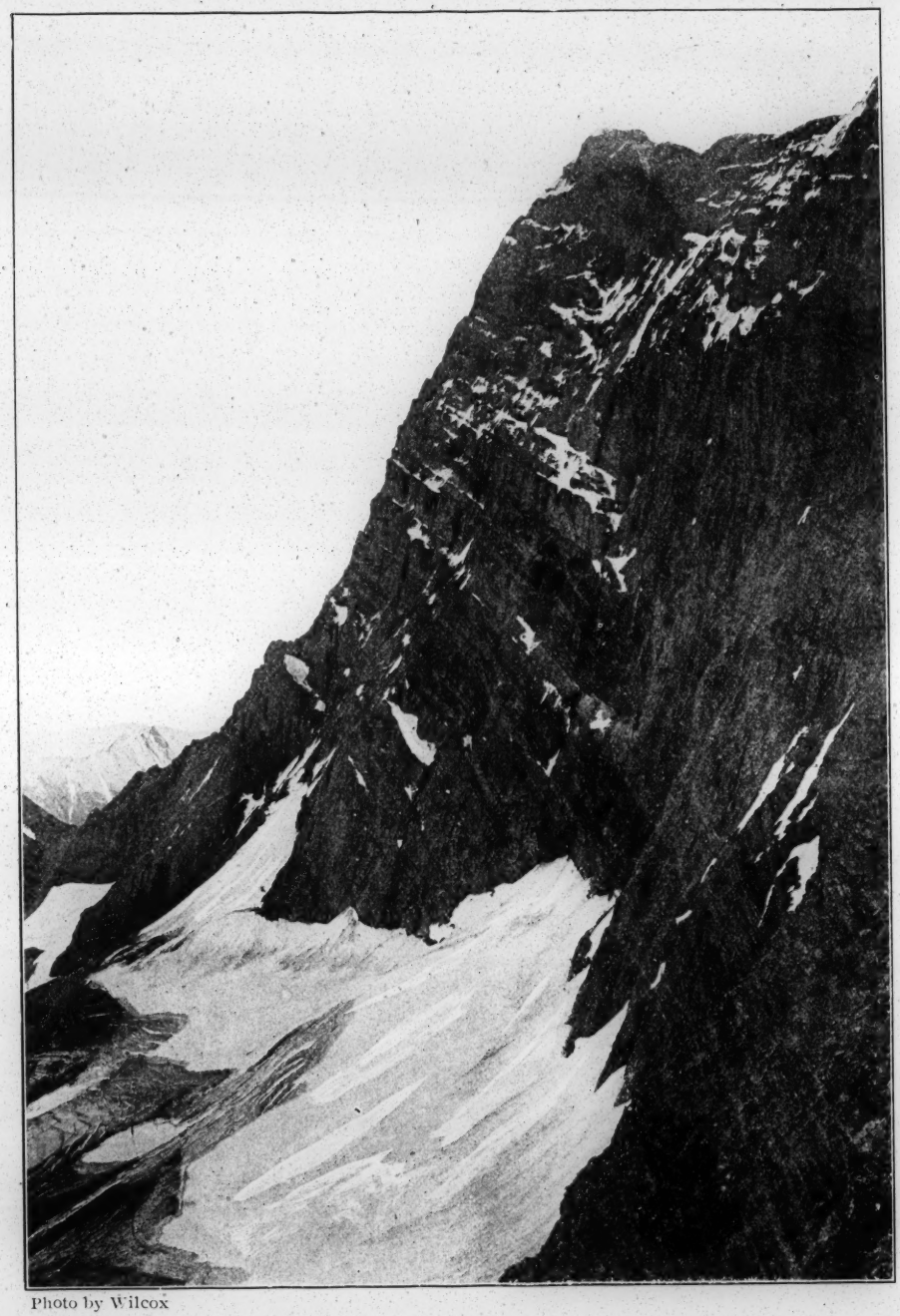


Photo by Wilcox

"Imposing precipices 3,000 or 4,000 feet above the valley"

the latter being covered by a light growth of the beautiful larch, which resembles the eastern tamarack. Between these ridges were lanes of green meadows and Alpine flowers in their prime. The plumy heads of the great white anemone, which blooms near melting snow banks in early spring, were mingled with innumerable painted-cups, showing every possible shade of orange, yellow, crimson, and purple, and several species of yellow and purple composite flowers. Jim Wood came back from a trip into the other valley and reported the trail rather dim and apparently but little used.

It would be natural to inquire why trails exist in an unexplored wilderness. Though somewhat difficult to explain, the fact remains that almost every accessible valley in these mountains has some kind of narrow pathway running through them. Successful exploration depends in a large measure on finding and keeping to them, as they are certain guides out of precarious situations or impassable forests. No doubt the Indians, in their hunting and trading expeditions between the Kootenai River and the northwestern plains, made these trails long before the first approach of his white conqueror. Once made, they are used by wild animals, and are only obliterated by forest fires, snow-slides, or the caving in of river banks. I feel convinced that the most frequent cause of forest fires is carelessness on the part of white men; the next cause is lightning, and, last of all, the Indian, who is careful of his game preserves and his routes of travel.

The next morning, August 10, was so cold that ice formed half an inch thick in our water buckets. The day's march was very interesting. The ascent and crossing of the pass is easy, as the pitch is comparatively gentle on either side. The trail has been used by mountain goats and elk, the tracks of which were very abundant. Upon reaching timber on the other side we were shielded from the cold west wind, and in full glare of the sun the air grew rapidly warmer, and the frost and ice of early morning were replaced by dew sparkling on the grass. From one point we had a magnificent view of the new valley for at least 15 miles. We thought it was either the head of the mysterious Bull River or some tributary to the Elk. After an hour of descent we lost the trail in very thick woods on the top of a ridge, and were nearly forced to retrace our steps, as the fallen trees were of immense size and very much crossed. Natural decay and wind storms were the causes of this blockade, as no forest fire had ever apparently run through this region.

After a very trying search the trail was located in a ravine below. This valley, like most others in these mountains, has a very steep slope in its upper part, for we had descended 2,000 feet in the first three miles, and then a gradual descent where the valley opens out and becomes wider. By the union of small tributaries which the trail crossed several times the stream becomes quite large, and as the valley is nearly level there are many swampy places. After two hours of hard work finding a way through fallen timber and miry places, a gradual change took place for the better. At length the trail became clear and the traveling so easy that we had an opportunity to admire our surroundings. It would be difficult, indeed, to describe the beauty of this valley. The lower of the two ranges of mountains on the east side, which we had seen the previous day on our mountain climb, was now alone visible, and made an almost unbroken line of cliffs rising from 1,500 to 3,000 feet above us in vertical precipices. Above the narrow valley, covered with pines and spruce, this imposing wall of blue-gray limestone towered in supreme grandeur. Meanwhile the trail followed the river,

which is here a broad stream with a winding course. Our long file of horses passed through a succession of glades where the forest trees came down to the river, alternating with fields of tall grass billowing in the breeze. In these meadows there were several old Indian camps, with their teepee poles standing ready for the next savage visitor. Each open place seemed to offer a new scene, some marvelous cliff reflected in a reedy pool or a long sweep of the river and a distant snow peak, while over all a typical summer sky full of white clouds and sunshine gave a cheerful aspect to everything.

Camp was made in a charming spot after an estimated march of about eight miles. The afternoon was devoted to photography and fishing, but Bryant was unable to catch any trout in the fine stream before our camp, though it had every appearance of being full of fish. If this river is a tributary of the Elk, it should be full of fish, as the latter is a sportsman's paradise. However, the presence of waterfalls often causes an absence of fish in many

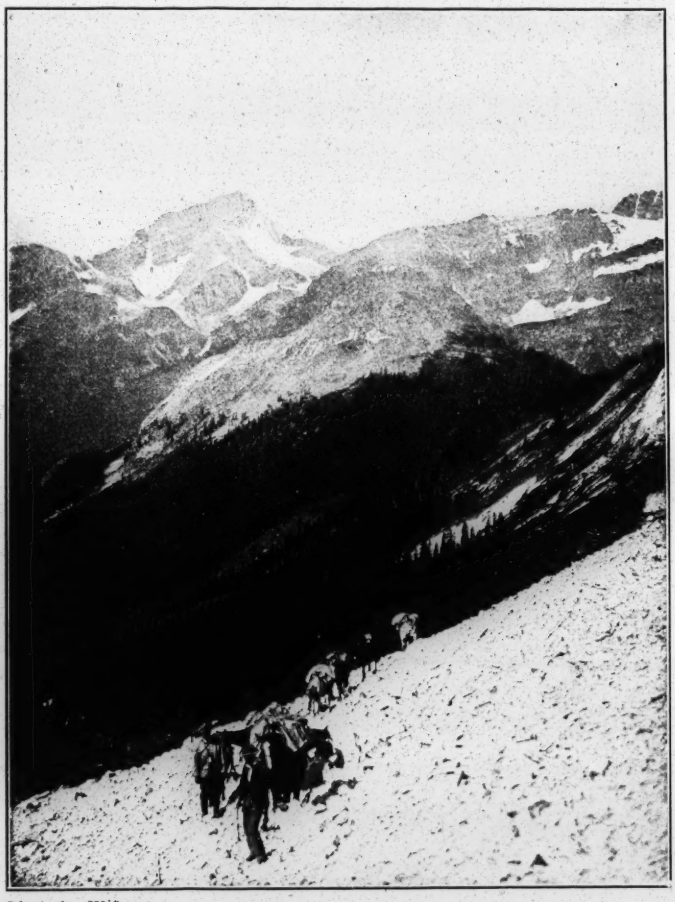


Photo by Wilcox

Climbing the Pass

streams and lakes where the conditions are favorable to them.

August 11 was partly cloudy in the early morning, but later the sky became perfectly clear. After two and one-half miles over a fine trail with a scarcely perceptible descent, we came to more

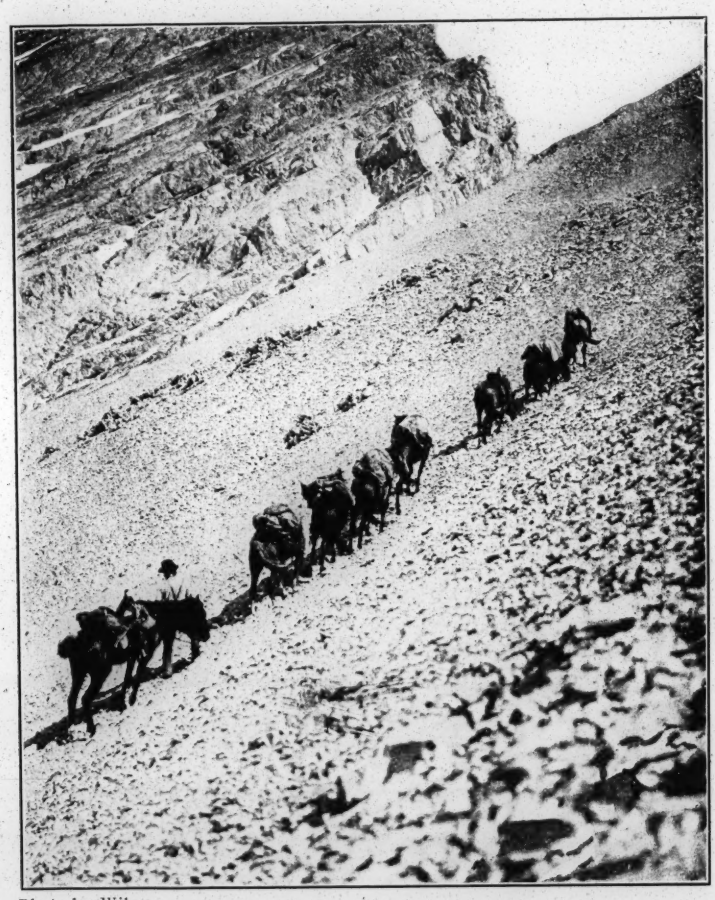


Photo by Wilcox

Approaching the Summit.

Indian teepee poles and a division of the trail. The cliffs on the east rise into two sharp peaks facing the valley and make a kind of natural gateway into what appears a second and higher valley beyond. One of the two trails crosses the stream and seemed to head toward this opening, or rather behind it, while the other continues down the main valley, which is apparently very long and has a slight turn toward the west of south. After some discussion as to the better route, we decided not to lose this chance to work east. We had been forced by a continuous range many miles further south than we wanted to go, and it seemed advisable to locate ourselves as soon as possible before a spell of bad weather should make exploration difficult, if not altogether out of the question. Leaving the main valley at

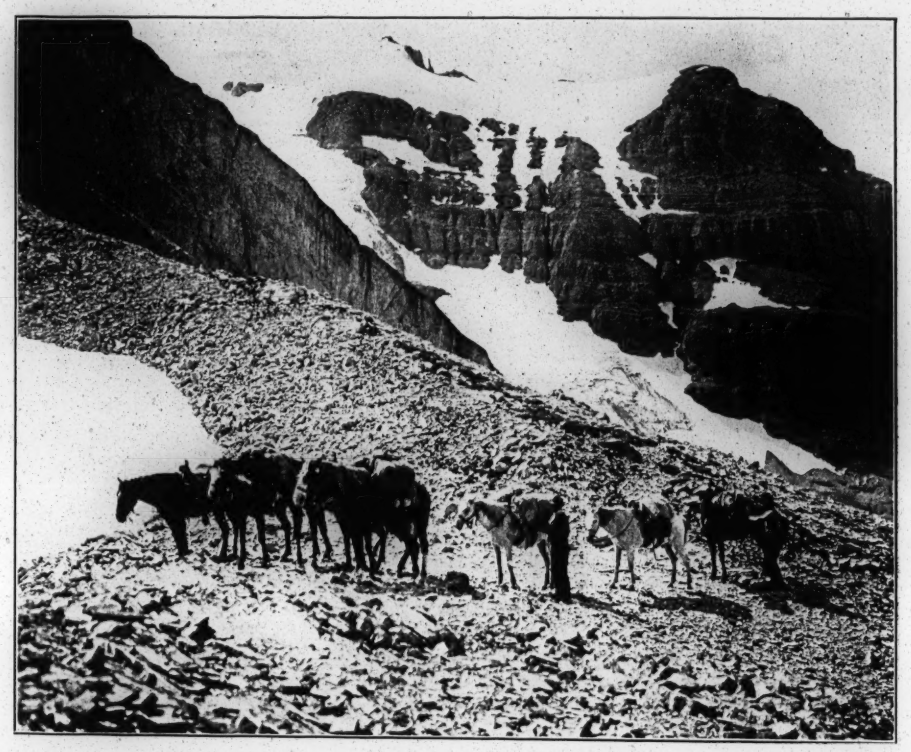


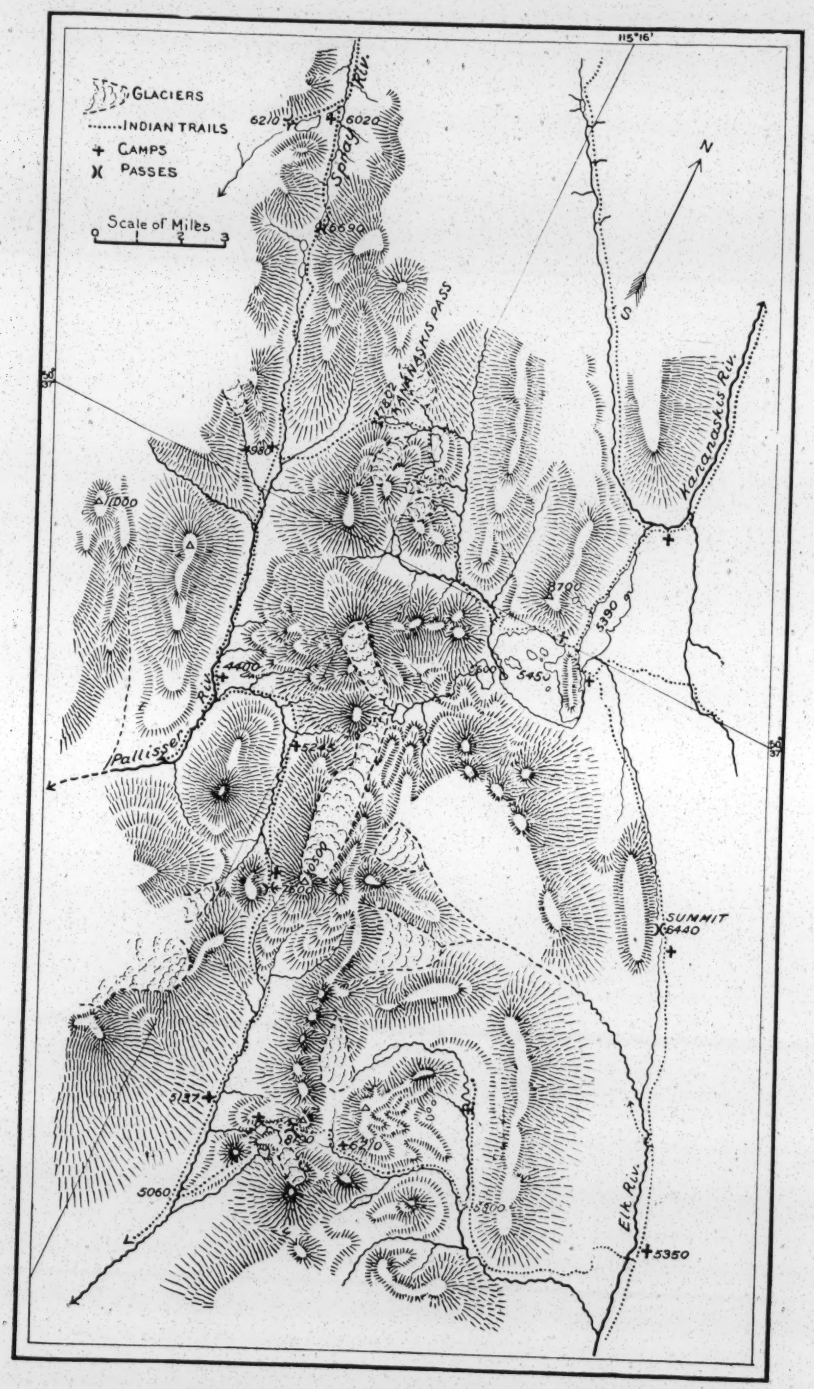
Photo by Wilcox

Resting on the Summit of the Pass

5,060 feet, the trail ascends sharply on the crest of a ridge running toward the natural gateway which had been seen from below. At 1,300 feet above the valley the scenery became very inspiring. A small lake now appeared below on our right, and after half a mile another glimpse of blue water was had over the pine trees. On the border of this we camped at 6,500 feet. Our tents were placed on a wooded point covered with deep, dry moss, projecting into the deep water of a charming tarn.

After lunch I set out with my camera to explore toward the east. My idea was to ascend a high ridge east of camp, from which I hoped to learn more about the country and possibly see the Kanaskis Lakes on the other side.

Shortly after leaving camp it was seen that a hoped-for pass, hitherto concealed, was blocked by a glacier. However, the trail led on and headed toward a ridge, which seemed from below a difficult scramble for a mountaineer. No other outlet appeared to right or left, and the trail was evidently too much used to lead only to some Indian camping place and stop there. Upon reaching a point 1,000 feet above the camp a magnificent view was disclosed. Our camp and the two round lakes nestling on the mountain side in the upper part of the forest belt lay below my feet. Beyond them, on the other side of the valley, stands a high mountain and a snow field several square miles in area. Ahead of me were the cliffs of two high mountains, on right and left, with sharp ridges and needles rising out of per-



Sketch Map of Region West and South of Kananaskis Lakes
by W. D. Wilcox

petual snow. The Indians in choosing a trail had most skillfully availed themselves of every little patch of soil and vegetation in a bare slope of limestone. On the upper parts, however, even these disappeared, and the trail was lined with sharp stones. A great deal of work had been done by throwing down the larger stones and paving a way with the smaller ones.

I approached the crest of the ridge at 8,140 feet with not a little excitement and interest. A short space of level ground makes the top of the pass, and then bends over into a valley of great depth. A large extent of new country was seen toward the east and south, with a green valley below and several ranges of mountains, all, however, of less height than those on either side of the pass, which were imposing precipices three or four thousand feet above the valley. How the Indians first got their horses over this place surpasses comprehension. Part of the trail was covered by snow even at this late date, and the slope was so steep that the stones were ready to slide. If a horse ever lost his balance here, it would be all over with him. After taking photographs, I made a difficult scramble to a spur half a mile distant to get a better view. Here I erected a cairn and took angles of all the prominent points. This otherwise barren peak was covered by forget-me-nots growing in the cracks of blue limestone, their stems short and stunted by cold. The beautiful clusters of bright flowers covered every slope and enlivened the bare rocks.

That night we had an excellent dinner, consisting, among other good things, of a grouse stew, the results of Tom's good hunting. Around the camp-fire we discussed the developments of the day, cheered by hotscotch, and now felt certain that the newly found valley would lead us into some tributary of the Elk River.

The next day, August 12, was warm and fair, with high fleecy clouds. The ascent and crossing of the pass by our fourteen horses was one of the most picturesque and interesting sights imaginable. The intelligent animals hardly knew what to make of the tremendous climb, and the sharp rocks cut their feet badly. We rolled down tons of stones, and repaired the trail as well as possible ahead of them. Both Bryant and I were busy also in getting snap shots of our pack-train from every point of view. A short rest and a precautionary tightening of cinches took place on the summit. Then ensued a still more difficult descent of 2,000 feet into the new valley. When we looked at the precipitous and snowbound pass from below, it seemed impossible that four-footed animals could traverse such a place. Nevertheless, thanks to the extraordinary care and skill of our packers, not one of the entire outfit of pack animals had a sore or chafed spot on his back, though most of them had been carrying from 150 to 200 pounds, jumping logs, and scrambling over steep passes every day for the past two weeks. The weather was very warm, and our tired animals had to fight swarms of bulldog flies and mosquitoes which appeared in this valley. The last two valleys had been almost free of them. Our men built smudges, around which the horses stood till late in the day, when a hard rain cooled the air, drove away the flies, and allowed our animals to feed in a meadow not far distant. Bryant walked about five miles down the valley in the afternoon to explore the trail, and said much less rain had fallen there than at our camp.

(*To be concluded in the June number*)

A GREAT AFRICAN LAKE*

By Sir Henry M. Stanley, M. P.

THE other day I was favored with a peep at Commander Whitehouse's map, and I was struck with the fullness of its detail and its accuracy. I took out my old note books, and then compared the rude sketches that I made as I went from camp to camp around the Victoria Nyanza twenty-seven years ago with the details which Commander Whitehouse has put in his map.

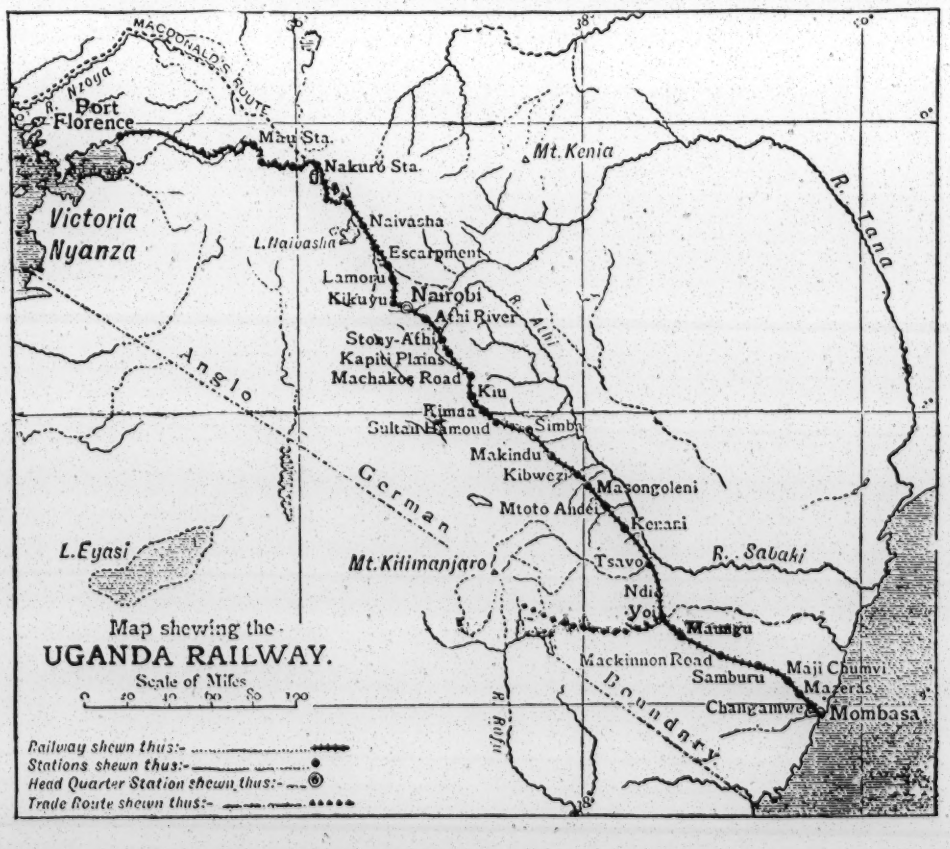
Mention has been made on more than one occasion of Ugowé Bay when speaking of this part of Africa. I remember when sailing from Bridge Island I came on a very spacious bay. Managing to get within about a hundred yards of the shore I saw a native and asked him what the name of the place was. I had to ask several times. Finally, in answer, I heard something which sounded like, "You go away." I said to myself, "Why, this must be a Swahili, who has fled from Zanzibar through committing some awful crime, and who has found shelter in this region." I again asked the man the name of the place, the man again replying, "You go away." Finally I got the interpreter to say that all I wanted was the name of the place, and again the answer was, "You go away." Under these circumstances I was, of course, bound to accept the name; anyhow, it would do very well as a landmark to indicate the place where the question had been asked, and it could be left to experts like Commander Whitehouse to come along some day and find out whether it was "U-jee-jee" or "You go away."

During his remarks Commander Whitehouse let slip a sentence which impressed me very much. He said, "The lake region is a very stormy one, and a day never passes without thunder, while a storm can always be seen somewhere, although it never lasts long. During the first survey of Port Florence, in 1898, there were no less than seventeen violent storms occurring within twenty-one days." On looking at the beautiful map shown by Commander Whitehouse I seemed to see the sailor, with his small crew and his little steel boat, wandering from point to point, crossing and recrossing, going from some island to some headland, taking his bearings from that headland back again to the island and to some point far away; then a tornado coming down, with a torrential downpour of rain, and perhaps a storm of hail, which threatened to fill the boat; then a few hours later a sun so fierce that the sides of the boat became so hot as to scorch the hand if they were touched. As I traced his many courses over the lake I thought to myself that Commander Whitehouse must have passed many anxious hours during the survey. He had said that he was occupied thirteen months in delineating the coast line of 2,200 miles in length.

When twenty-seven years ago I was instructed to go into that part of the world it was understood that I had to settle a question which very much vexed geographers at that time. According to Speke's theory that great lake, to which he had given the name "Victoria Nyanza," was one vast body of water almost equal to the size of Scotland in area, whereas, according to Sir Richard Burton, it was only a series of small lakes or swamps. The problem I had to settle was, which of the explorers was right. Hence I had to circumnavigate the lake. I carried a little sectional boat, built at

* Republished from *The Independent* by courtesy of the editors.

Teddington-on-Thames, and, after fifty-seven days' voyage with numerous adventures, I came back to the point from which I had started. Even had I had the time to examine more carefully the inlets, bays, creeks, and gulfs of the Lake Victoria, I could never have hoped to lay them down with the remarkable accuracy displayed by Commander Whitehouse. I remember that twenty-seven years ago after rounding the southern side and the eastern and northern coasts of the lake, and coming half way down, just south of the equator, we were driven from the mainland by some cantankerous natives, and came to a small islet where at last we were perfectly safe from all harm and had leisure to reflect. Ascending to the highest peak of that little islet, I saw a boundless extent of fresh-water sea toward the north, east, and south, while toward the west and southwest there was a magnificent extent of hitherto-unexplored territory. I could not help but admire the scene, and I seemed to see as in a vision what would happen in the days to come. I seemed to see steamers trailing their dark smoke over the gray waters of the bay, loaded with passengers and natives about to exchange and barter at some well-established port, and the natives of Uganda, instead of looking with contempt upon the wild, savage Usukuma at the south, willingly coming down to exchange their coffees for the cattle of Usukuma, and shaking hands in all friendship with the natives of the east coast making blood-brotherhood with the natives of



the west coast ; I seemed to hear church bells ringing at a great distance away, and I hoped and prayed that some day that vision might be realized.

Twenty-seven years have passed, and I think it will be admitted that we are on the eve of the realization of that vision. In those days Mtesa, of Uganda, impaled his victims and clubbed his women to death upon the slightest provocation ; the slingers of the islands stood ready to welcome the wayfarer or the traveler with showers of stones, and along all the shores described by Commander Whitehouse there was a group here and there, or an army at another place doing all the tricks common to barbarous people, and sighing and thirsting for blood. Those days have passed by. The missionaries have been laboring since 1877 in Uganda, and as the result of their labors can show 90,000 Christian people. Three hundred and twenty churches have been established there, and there are many thousands of children at school. It was only the other day I received a letter from a man at Mengo saying there were 500 children in the Mengo school every day. The converts of Uganda are now actually carrying the gospel to the distant lands of the west. Toro has been made acquainted with the gospel. Usongora, which was a wild and devastated country only twelve years ago, now welcomes the white traders ; at Kavalli, where I rested some months, the people are beginning to take a strong interest in the white man's religion.

Such has been the change wrought in twenty-seven years. Though it has been slow work; though missionaries have often felt depressed, broken-hearted, and dispirited, suffered persecution and been expelled from Uganda; though the native converts have suffered torture and death, still the missionaries have persevered, and in the end they have received their reward. They now know that the terminus of the great railway is built on the very shore of the lake, while one steamer, the *William Mackinnon*, is daily trafficking between Port Florence, on the east, and Entebbe, on the northwest. She is but the precursor of a fleet of such steamers.

In 1880, 1881, and 1882 I carried three small steamers on to the Upper Congo ; today there are eighty, with a tonnage of about 10,000 tons. Today there is only one steamer of seventy-five feet in length on the Victoria Nyanza ; in ten years hence there will very likely be fifty, in twelve years one hundred, in fifty years two hundred, and that is the way civilization will go on spreading out and stirring the dark peoples to activity.

There are two main motives for which the British nation voted the money for the construction of the Uganda Railway. The first is the suppression of the slave trade, and the second was to effect an uninterrupted and speedy communication between the sea and what is called the "Pearl of Africa," and today those two objects have been accomplished. The slave-trader cannot now be found in those regions, otherwise the very sight of a white man would be fatal to him, while as for the uninterrupted and speedy communication, it only now requires two and a half days to reach Uganda from the sea, whereas it previously occupied months. Speke took nine months to reach Uganda ; it took me eight ; but two or three years ago it took the missionaries generally six months. One brave and energetic traveler takes three months. Now it can be done in two and a half days.

If the lake region has advanced so marvelously as it has done during the slow period, when the laden porters carried the loads of the missionary, the sugar chest of the trader, and the weights of the steamer up to Uganda, what will be its rate of progress now that Uganda is brought within two and a half days of the sea? While con-

gratulating ourselves on what has been accomplished during the last twenty-seven years, we should remember gratefully the services of the missionaries, and also of those wise men who, like Sir Gerard Portal, emphasized over and over again to the government the need of the Great Uganda Railway to redeem the land. We must also recollect the sagacious administrators who have been sent to Uganda, who, by their tolerance and tact, have taught the natives wherever they go that the advent of the Englishman was a blessing to them.

COAL RESOURCES OF ALASKA

ALASKA embraces about 600,000 square miles and stretches through nearly 20 degrees of latitude and 50 degrees of longitude. Practically no detailed investigations of any part of this vast territory have been made, and at least a third part of its area has not even received preliminary topographic and geologic surveys. Our knowledge of its mineral resources is therefore very incomplete.

What is known of its coal resources has been compiled and is presented by Mr. Alfred H. Brooks in Part III of the Twenty-second Annual Report of the United States Geological Survey. This compilation is not from printed sources alone, but is largely from manuscript notes made on the spot by Mr. Brooks himself and by others. Mr. Brooks divides Alaska, for purposes of his report, as follows: Beginning on the south, southeastern Alaska includes the Pacific Ocean coastal belt and islands, extending northward to Mount St. Elias and northwestward so as to include the Copper River Basin. Beginning on the west, southwestern Alaska embraces the Aleutian Islands, Alaska Peninsula and adjacent islands, Kenai Peninsula, and the Cook Inlet region, with the drainage basins of its tributary rivers. The Kuskokwim region lies west of Bristol Bay and Cook Inlet and east and south of the Yukon, and drains into southeastern Bering Sea chiefly through the Kuskokwim River. The eastern part of this region is broken by the Alaskan Range of mountains. To the west of these mountains is the broad basin of the Kuskokwim River. A small southern part of this region drains directly into Bering Sea by a number of short rivers.

The Yukon Basin includes a great area lying partly in Alaska and partly in British Northwest Territory and British Columbia. The chief tributaries of the Yukon are Koyukuk, Tanana, Porcupine, White, Pelly, and Lewes rivers, the two last uniting to form the Yukon proper, and their drainage basins are wholly within Canadian territory. The larger part of the basin is occupied by the great Yukon Plateau, sloping from about 5,000 feet near the headwaters above sea-level to 2,500 feet at the great bend of the river. East of this plateau lies the northern extension of the Rocky Mountains, which near the Arctic Coast turns abruptly west, parallel to the coast, forming the Romanzof, Davidson, and De Long mountains, the Arctic-Yukon watershed. On the southwest side of the Yukon Basin the Coast Range and the St. Elias Range and the Alaskan ranges form the barrier and in part the watershed of the basin. Northwestern Alaska includes an ill-defined area northwest of the Yukon Basin. Seward Peninsula, cut off from the mainland by Norton Sound on the south and Kotzebue Sound on the north, is an important feature of this province. Several rivers drain from this area into Bering Sea and the Arctic Ocean.

Northeastern Alaska has been but little explored. It includes the drainage basins of rivers between Point Barrow and the international boundary. The geology and mineral resources of this region are unknown. The occurrence of coal in Alaska, as in the western United States, is limited to the rocks of the later geologic periods (the Mesozoic and Tertiary). The rocks of these ages have an extensive distribution in the territory, and at a number of widely separated localities workable coal beds have been found.

In 1852 the Russian-American Company prepared to open coal mines at Port Graham, on the western side of Kenai Peninsula, but soon abandoned their operations, though an American company mined coal at Port Chatham and supplied the Russian company's steamers for about ten years longer. In 1868 a few tons of coal were mined at Kootznahoo Inlet, Admiralty Island, for the United States Steamship *Saginaw*, and in 1868 coal was reported near Point Gardiner, Admiralty Island. Considerable prospecting has been done at Killisnoo, Admiralty Island, and the Firestone mine has been worked for local use since 1880. The Admiralty Coal and Fuel Company did considerable development work in 1900 at Point Gardiner.

In 1872 coal was mined at Coal Bay, Unga Island, for the United States Steamship *Humboldt*, and the mining of these southern Alaska coals has gone on in a small way for a number of years. In 1888 the Alaska Coal Company began mining at Kachemak Bay, west of Kenai Peninsula, and since 1899 the Cook Inlet Coal Fields Company seems to have controlled this field, and are now operating extensively. Since 1893 the Alaska Packers' Association has been mining intermittently at Chignik River, southeastern Alaska Peninsula. In 1889 the development of coal mines at Herendeen Bay, western Alaska Peninsula, was begun, but without great success.

The coals of the Yukon River attracted little attention until the discovery of gold in the Klondike region, in 1897. Within a year there were probably upward of a hundred steamers on the Yukon River, with wood selling at from $8 to $20 a cord, and with no wood to buy on the lower Yukon below the Holy Cross Mission. Soon some of the larger companies established a coaling station at St. Michael for the use of river steamers, but with the resultant disadvantage that the steamer must take most coal when she has most freight. Much investigation of the coal supply of the Yukon River has taken place. In addition to coal mines in British Northwest Territory, the Alaska Exploration Company started some developments about 60 miles above Circle City, on the upper Yukon. The oldest mine is Drew's, opposite the mouth of Hess Creek, where the workings are extensive, and the equipment includes steam hoisting apparatus, coal bunkers, etc. The Pioneer mine, below Hess Creek and 30 miles above Rampart, is similarly equipped. Both mines produced considerable coal in 1900. Near Nulato, farther down the Yukon, the Blatchford and the Pickart mines produced some coal, and the Clemens Thein mine and the Williams mine, both between Nulato and Anvik, were small producers in 1900. As a result of the development of the Cape Nome gold fields, the Cape Lisburne coal deposits, in northwestern Alaska, have attracted renewed attention, and the Corwin Trading Company is now engaged in endeavoring to develop these deposits to supply Nome and the whaling ships, which have heretofore brought their coal from Puget Sound.

The coals are chiefly lignites, with some bituminous coals, and in a few localities semi-anthracites. Developments so far have been entirely along waterways.

The southeastern and southwestern Alaska coal fields are on tide water along a coast affording good harbors open to navigation the entire year. They can be mined cheaply and can find a ready market for local steamboat and domestic use. No developments have been made of the higher-grade coals of southern Alaska. These higher-grade coals are worthy of the attention of prospector and capitalist, for, if found to occur in sufficient quantities, they could compete with all other coals in the Pacific Coast market.

The Yukon coals as developed depend entirely on their local market. Their grade is loo low for exportation; but the Yukon coals seem to vary greatly in character, and careful preliminary work should be done before a mine is developed. The Yukon coals are said to bring about $15 a ton at the mines. Nome has offered a splendid market for coal during the last two years. Coal sold there at from $25 to $100 per ton, with an average price of about $40 to $50 per ton during the summer of 1900. It was this that led to the development of the Cape Lisburne field, where the coals are of a semi-bituminous character, which is only 200 miles distant.

In 1900 about 13,000 tons of coal were shipped as cargo to Alaska from Washington ports, and probably still more was imported from British Columbia. No accurate data as to the coal produced by Alaskan mines are obtainable, but the total is probably between 4,000 and 5,000 tons, of which about a third is from mines on the Yukon River.

THE HUBBARD MEMORIAL BUILDING

THE cornerstone was laid on April 26 of the Hubbard Memorial Building, which will be the home of the National Geographic Society. The building occupies a large and handsome site on the southwest corner of Sixteenth and M Streets, Washington, D. C., and when completed will be a notable monument to the honored first President of the Society.

The contents of the box deposited in the cornerstone were as follows:

1. An engrossed document relating to the *Hubbard Memorial Building*, and also to the *Hubbard Memorial Window* in the Church of the Covenant, Washington, D. C., both dedicated to the memory of the late Hon. Gardiner Greene Hubbard. This document is signed by Mrs. Hubbard and by all the surviving descendants. The following is a copy of it:

HUBBARD MEMORIAL BUILDING

This building is erected in memory of GARDINER GREENE HUBBARD by his children, Gertrude, Mabel, Roberta, and Grace. Gertrude, being no longer living, is represented by her only child, Gertrude, daughter of the late Maurice Neville Grossmann, and Roberta, being no longer living, is represented by her surviving children, Helen and Grace, daughters of Charles James Bell.

The library is the gift of Mrs. Gardiner Greene Hubbard, who joins her children in establishing this memorial to her husband.

The building is designed to be the home and headquarters of the National Geographic Society, of which Mr. Hubbard was President from the date of its organization, January 20, 1888, to the day of his death, December 11, 1897.

Another monument to Mr. Hubbard exists in the Church of the Covenant,

Washington, D. C., in the form of a *Memorial Window* presented by Mrs. Hubbard, which portrays in allegory the leading characteristics of Mr. Hubbard's life and its tranquil close in the midst of his useful and abounding work.

The memorial window may be identified from the following published description:

"A stately figure stands with uplifted face, looking toward the western sky; the glory of the sunset is above and about him; fields of green and yellow spread around him; sheaves of golden grain are heaped beside him; from his hand the seed still drops into the open furrow, the soft shadows fall, and the evening star rises."

The box containing this document and other papers and coins will now be sealed and deposited in the cornerstone of the Hubbard Memorial Building in the presence of Mrs. Gardiner Greene Hubbard, and all the surviving descendants of Mr. Hubbard, together with a few personal friends.

The cornerstone will be laid by Melville Bell Grosvenor, the infant great-grandson of Gardiner Greene Hubbard, in the arms of Mrs. Hubbard.

Witness our signatures this 26th day of April, 1902.

GERTRUDE M. HUBBARD (MRS GARDINER GREENE HUBBARD)

CHILDREN

MABEL GARDINER BELL AND HER HUSBAND, ALEXANDER GRAHAM BELL
GRACE HUBBARD BELL AND HER HUSBAND, CHARLES J. BELL

GRANDCHILDREN

GERTRUDE HUBBARD GROSSMANN
ELSIE MAY BELL GROSVENOR AND HER HUSBAND, GILBERT H. GROSVENOR
MARIAN H. GRAHAM BELL
HELEN A. BELL
GRACE HUBBARD BELL
GARDINER HUBBARD BELL
BOBBY BELL

GREAT-GRANDCHILD

MELVILLE BELL GROSVENOR (×) HIS MARK

2. A copy of the NATIONAL GEOGRAPHIC MAGAZINE issued February, 1898, vol. ix, No. 2, containing:

A portrait and signature of the Hon. Gardiner Greene Hubbard.

Address of Rev. Dr. Hamlin delivered at the memorial services held at the Church of the Covenant, December 13, 1897.

Proceedings of the memorial meeting of the National Geographic Society held January 21, 1898.

Introductory remarks by the President, Alexander Graham Bell.

Address of Dr. George N. Sternberg, Surgeon General, U. S. A., on behalf of the Joint Commission of the Scientific Societies of Washington, D. C.

Addresses of Prof. S. P. Langley and the Hon. William L. Wilson, on behalf of the Smithsonian Institution.

Address of Miss Caroline A. Yale, principal of the Clarke School for the Deaf, on behalf of the American Association to Promote the Teaching of Speech to the Deaf.

Address of Dr. B. L. Whitman, President of Columbian University, on behalf of the University.

Address of Dr. Marcus Benjamin, on behalf of the Society of Colonial Wars.

Address of Dr. Daniel C. Gilman, President of Johns Hopkins University, on "Gardiner Greene Hubbard as a Helper."

Address of Major John W. Powell, on behalf of the journal *Science*.

Address of the Hon. A. R. Spofford, on behalf of the Columbia Historical Society.

Address of the Hon. John W. Ross, Chairman of the Board of Commissioners of the District of Columbia, on behalf of the city of Washington and the District of Columbia.

Address of General A. W. Greely, on behalf of the National Geographic Society.

3. A copy of the *Association Review*, an educational magazine published by the American Association to Promote the Teaching of Speech to the Deaf, October, 1899, vol. 1, No. 1, containing:

A portrait and signature of Gardiner Greene Hubbard, and

An account of the life of Gardiner Greene Hubbard by his wife, Gertrude M. Hubbard.

4. A book entitled "The Story of the Rise of the Oral Method in America, as told in the writings of the late

Hon. Gardiner G. Hubbard," published Washington, D. C., 1898, containing:

A portrait and signature of the Hon. Gardiner Greene Hubbard.

An introduction by his daughter, Mabel Gardiner Bell (Mrs. Alexander Graham Bell).

Extracts from the writings of the Hon. Gardiner Greene Hubbard relating to the education of the deaf, compiled and arranged by his daughter, Mabel Gardiner Bell.

5. A copy of the *Association Review*, dated February, 1900, vol. II, No. 1, containing the opening chapters of a work entitled "Historical Notes Concerning the Teaching of Speech to the Deaf," published as a tribute to Mr. Hubbard's labors on behalf of the deaf, written by his son-in-law, Alexander Graham Bell.

6. A composition on the life of Gardiner Greene Hubbard, written by the pupils of the Gardiner Greene Hubbard School, Washington, D. C., eighth grade—Horton Simpson, principal, April 17, 1902.

7. A pamphlet entitled "The Education of Deaf-Mutes: Shall it be by signs or articulation?" by Gardiner Greene Hubbard, published Boston, Mass., 1867; contributed by the Hon. John Hitz, superintendent of the Volta Bureau for the Increase and Diffusion of Knowledge Relating to the Deaf, Washington, D. C.

8. A pamphlet entitled "Further Contributions to the Study of that Subtile Art which may Inable one with an observant eie to heare what any man speaks by the moving of the lips (Bulwer, 1648)," by Mrs. Alexander Graham Bell; extracted from the Proceedings of the Fourth Summer Meeting of the American Association to Promote the Teaching of Speech to the Deaf, July, 1894.

9. A poem by Major John W. Powell, entitled "*Becoming*," dedicated to Mrs. Gardiner Greene Hubbard.

10. Specimens of United States coins.

11. Miscellaneous.

GEOGRAPHIC NOTES

FORECASTING THE WEATHER

IN a recent address, published in the *Marine Review*, Prof. Willis L. Moore, Chief of the Weather Bureau, emphasized the point that any person, by studying the few simple principles on which the daily weather map is founded, can estimate the general character of the weather for his region one, two, or, at times, three days in advance.

"By preserving the weather charts each day and noting the movements of the highs and the lows, any intelligent person can make a fairly accurate forecast for himself, always remembering that the lows, as they drift toward him from the west, will bring warmer weather and sometimes rain or snow, and that, as they pass his place of observation, the highs following in the tracks of the lows will bring cooler and probably fair weather.

"He can closely forecast the temperature for his region by remembering that the weather will be cool so long as the center of the predominating high, *i. e.*, the high enclosing the greatest area within the 30-inch isobar, is north of his latitude—either northeast or northwest—and that it will be warm so long as the high is south of his latitude. . . .

"To get a rough idea of the difference between storms, we might classify them, according to the diameter of the gyrating masses of air under their influence, as follows:

"Cyclones, 1,000 to 2,000 miles; hurricanes, 100 to 500 miles, and tornadoes,

100 to 1,000 feet. We might imagine their vortical action and their destructive force to increase in some ratio as their diameters of rotation decrease.

"The tornado is always an incident and a sporadic outbreak of the cyclone, and usually occurs in the southeast quadrant of a cyclonic storm.

"The thunder-storm, instead of rotating about a vertical axis, like the cyclone and tornado, has a horizontal roll, caused by cold and heavy air from above breaking through into a lighter and superheated stratum next to the earth. This rolling motion throws forward the cool air in the direction in which the cloud is moving. In general, thunder-storms move from the west toward some eastern point, the same as tornadoes, which mostly move from the southwest toward the northeast. If any part of the horizontally rolling air in the thunder-storm drops down toward the earth and adjusts its rotation about a vertical axis it at once becomes a tornado, and its destructive force is increaed a hundredfold."

NO NEWS OF ANDRÉE

THE recently revived reports that portions of the balloon in which Andrée attempted to reach the North Pole had been found in northern Canada have been discredited by the commissioner of the Hudson Bay Company in a letter to Mr. William Ziegler, of New York. The commissioner writes in part as follows:

"It is a matter of great regret to me that I cannot bring myself to offer encouragement to any hopes which friends of the explorer may have of his still surviving anywhere in northern Canada. In the few portions of the Far North where the company's people do not come in touch with the natives, whaling vessels from American and British ports traffic with the natives.

"There is no probability of there being any truth in the report regarding the supposed finding of Andrée's balloon. The chief officer of the company on the west coast of Hudsons Bay, who himself interviewed the natives on the matter, has reported as his firm conviction that the natives who are said to have seen the balloon imposed upon the clerk at Churchill, to whom the story was given. The sketches of the balloon which the company has been careful to distribute throughout northern Canada naturally gave occasion for much talk among these isolated people, and it is not greatly to be wondered at that some such tale might be given out by natives peculiarly cunning and prone to practice upon the credulity of those not familiar with them or easily imposed upon."

COMMANDER BORCHGREVINK

C. E. BORCHGREVINK, the Antarctic explorer, who has gone farther south than any man, has made formal application to become an American citizen. On April 25 he filed his first papers at Washington.

The American Robert E. Peary holds the record for having reached the most northerly land, so that the United States may now claim as citizens the two men who have reached the most remote land at each end of the globe. Lockwood and Brainard, of the Greely expedition, had for 18 years, from 1882 to 1900, held the record of the most northerly land, 83° 25′, which Peary surpassed by 15′ in the spring of 1900, when he reached 83° 39′. The Italian Duke of Abruzzi has been farthest north on the open sea, 86° 33′.

Carsten Egeberg Borchgrevink (the ch is pronounced hard, like k) was born at Christiania in 1864. His training and taste made him a sailor scientist. Early in the nineties he led one expedition to the far south, in which he did some notable work, but the expedition

was especially valuable, in that it gave him good experience in South Polar work. His great achievement, however, was in his last expedition of 1898–1900, when his party was the first in history to pass the winter camped on the Antarctic Continent. He penetrated farther south than any man had ever done before, and also made some important biological discoveries. Among his collections he brought back a jelly-fish weighing no less than 90 pounds.

Mr. Borchgrevink's plans are yet too indefinite to announce. He will for some years yet be a rover, but the United States will be his home.

On April 12 President Alexander Graham Bell gave a dinner in Washington in honor of Commander C. E. Borchgrevink. Vice-President W J McGee, as the toastmaster of the evening, introduced the following toasts:

"The President of the United States," Justice Harlan; "His Majesty King Oscar," Mr. Hauge, Secretary of the Swedish and Norwegian Legation; "The Navies of the World," Admiral Dewey; "Our Nation and Others," Senator O. H. Platt, of Connecticut; "The Explorers of the Ends of the Earth," Rear Admiral Melville, General Greely, Mr. Walter Wellman, Commander Borchgrevink; "The National Geographic Society," President Graham Bell.

Those present were: President Alexander Graham Bell, Commander C. E. Borchgrevink, General Greely, Mr. F. V. Coville, Mr. S. H. Kauffmann, Mr. Henry Gannett, Mr. Walter Wellman, Hon. David J. Hill, Admiral Dewey, Dr. W J McGee, Justice Harlan, Admiral Melville, Mr. C. J. Bell, Mr. O. H. Tittmann, Mr. Arthur W. McCurdy, Col. Henry F. Blount, Prof. A. J. Henry, Mr. Marcus Baker, Mr. Angelo Heilprin, Mr. George Kennan, Prof. Willis L. Moore, Representative E. J. Hill, of Connecticut; Mr. Hauge, Senator O. H. Platt, of Connecticut; Mr. George Eastman, President Eastman Kodak Company; Dr. C. Hart Merriam, Mr. Gifford Pinchot, and Mr. Gilbert H. Grosvenor.

DECISIONS OF THE U. S. BOARD ON GEOGRAPHIC NAMES.

January to April (inclusive) 1902

ALL decisions rendered by the Board from its creation down to April, 1900, were published in its second report, March, 1901. For decisions rendered during the remainder of 1900 and in 1901, see NATIONAL GEOGRAPHIC MAGAZINE, vol. xi, pp. 329, 478; vol. xii, pp. 87, 125, 200, 242; vol. xiii, p. 28.

Aektok; island, near west end of Avatanak Island, Krenitzin group, eastern Aleutians, Alaska (not Aiaktak, Goloi, Goly, Ouektock, nor Rootok).

Agamgik; bay, indenting the northern shore of Beaver Bay, Unalaska Island, eastern Aleutians, Alaska (not Food).

Battery; point, the eastern head of Sarana Bay, on south shore of Akutan Island, eastern Aleutians, Alaska (not Kaianak, Liberty Cap, nor South Head).

Bosporus; strait between Black Sea and Sea of Marmora, Europe. (This is a reversal of the decision Bosphorus, rendered by the Board January 12, 1897.)

Chiwawa; creek, Chehalis County, Washington (not Chiwahwah).

Curlew; creek, lake, and post-office, Ferry County, Washington (not Karamin nor Karamip).

Forest; lake, in Woodbury, Orange County, New York (not Slaughter's Pond).

Goosmus; creek, Ferry county, Washington (not Goos nor Koosmus).

Howes; cave in Cobleskill, Schoharie County, New York (not Otsgaragee).

Howes Cave; post-office, Schoharie County, New York (not Howecave, Howe Cave, Hows Cave, nor Howe's Cave).

Iliuliuk; the chief town of Unalaska, eastern Aleutians, Alaska (not Unalaska).

Kisselen; bay, at the head of Beaver Bay, Unalaska, eastern Aleutians, Alaska (not Kissialiak, Warsham, nor Worsham).

Levashef; port or harbor at head of Unalaska Bay, Unalaska, eastern Aleutians, Alaska (not Captains nor St. Paul).

Marcy; mountain peak, the highest point in the Adirondacks, Essex County, New York (not Tahawus).

Mechanicville; post-office and village, Saratoga County, New York (not Mechanicsville). (This is a reversal of the decision Mechanicsville, rendered by the Board April 4, 1900.)
Rabbit; creek, Ferry County, Washington (not Nine Mile).
Samganuda; bay indenting the eastern shore of Unalaska, eastern Aleutians, Alaska (not English).
Sanpoil; lake and river, Ferry County, Washington (not Rowena nor San Poil).
Sigak; cape, the north point of Akutan Island, eastern Aleutians, Alaska (not North Head).
St. Helens; mountain, in Skamania County, Washington (not St. Helen).
St. Peter; creek and flat, Ferry County, Washington (not Rock).
St. Vrain; creek and precinct, Weld County, Colorado (not St. Vrains).
Tanaskan; bay, indenting the southern shore of Beaver Bay, Unalaska, eastern Aleutians, Alaska (not Macks nor Taneska).
Tangik; islet, near the eastern shore of Akun Island, Krenitzin group, eastern Aleutians, Alaska (not Waverly).
Tanginak; islet, east of Akun Island, in Unimak Pass, Alaska (not Breed nor Propagation).
Teroda; creek and mountain, in Ferry and Okanogan Counties, Washington (not Tarrota nor Toroda).
Ugalgan; island, near the easternmost point of Unalaska, eastern Aleutians, Alaska (not Egg, Gagalgin, Iachnoi, Jaitschoi, Kigalgin, nor Orieshik).
Unalaska; bay, indenting the northeastern shore of Unalaska Island, eastern Aleutians, Alaska (not Captains).
Urilia; bay, on the northern coast of Unimak, eastern Aleutians, Alaska (not Shag nor Shaw).
Usof, bay, indenting the southeastern shore of Unalaska, eastern Aleutians, Alaska (not Whalebone).
Wallkill; river, in Ulster and Orange Counties, New York (not Wall Kill).
Witchcoat; point, Back River, Baltimore County, Maryland (not Witchcoate).

THE LATEST MAP OF SOUTHERN CALIFORNIA

THE United States Geological Survey has just issued the first of a series of three map sheets which will cover the region in California extending from San Diego to Santa Barbara, including the adjacent mountain ranges, and will form a map of the whole southern portion of the state.

Sheet No. 1, which has lately been issued, is compiled from 23 atlas sheets of the U. S. Geological Survey. It comprises within its limits the San Gabriel Timber-land Reserve, the San Bernardino Forest Reserve, the Trabuco Canyon Forest Reserve, and parts of the San Jacinto, Pine Mountain, and Zaca Lake Forest Reserves. It contains all of Orange County, the greater part of Los Angeles County, and portions of Riverside and San Bernardino counties. It includes all of what may be termed the Great Valley of Southern California, extending from Los Angeles to the vicinity of San Bernardino, as well as the mountains which are the source of the waters that irrigate its orchards and farms. These map sheets, which are listed by the Geological Survey at 10 cents each, are 21 by 33 inches and are drawn on a scale of about four miles to the inch. The relief of the country is shown by contour lines.

EXPEDITIONS IN THE ARCTIC AND ANTARCTIC

LIEUT. ROBERT E. PEARY is now leading his last campaign to gain the North Pole. He probably started from Cape Hecla some weeks ago, and is now well on his way north. The Peary auxiliary steamer, under command of Mr. H. L. Bridgman, will leave Sidney, N. S., about the middle of June to carry supplies to Peary and to bring him home.

The Baldwin auxiliary expedition will sail from Tromsö, Norway, on July 1. The expedition will be in charge of W. S. Champ, secretary to William Ziegler, who is Mr. Baldwin's financial backer.

No news has now been had of Sverdrup since 1899. It is generally believed he is among the Parry Islands. Con-

siderable anxiety is felt in Sweden and Norway for his safety, and a relief expedition is planned to set out in a few weeks.

It has been cabled from Europe that Baron Toll, who has been seeking to repeat Nordenskiold's voyage around the entire north coast of Asia, has given up his original plan and is now returning to St. Petersburg. His vessel passed the winter among the New Siberia Islands. There was not coal enough to continue the voyage eastward, and to transport coal to the New Siberia Islands would have cost so much that the original plan was abandoned. It is stated that Baron Toll is proceeding up the Lena River, and will meet the Trans-Siberian Railway at Irkutsk.

In the South Polar regions the German expedition on the ship *Gauss* sailed from the Kerguelen Islands in the latter part of January of this year, bound for Termination Land. The party were in good spirits, and everything ready for a successful winter.

The English expedition, after considerable difficulty with their vessel, the *Discovery*, because of its leaking, sailed from New Zealand early in 1902, bound for Victoria Land. A relief expedition is now being prepared in England. King Edward has subscribed $500 toward the expenses of the party.

The Swedish South Polar Expedition reached Cape Horn too late in the season to proceed very far south. The expedition will remain among the New Falkland Islands during the present southern winter, and then proceed south toward the end of 1902.

Dr Emil Holub, the well-known explorer of interior Africa, died on February 21, 1902. As a young man Dr Holub read the journeys of David Livingstone and became greatly interested in the problems of natural life on the great continent. After studying medicine and natural science at Prague he went to South Africa in 1872, as a doctor to the diamond fields. During the next few years he made several journeys into the interior, in 1875 reaching the Zambezi and Victoria Falls and always making large collections. On his return to Europe in 1879 he distributed his many collections to 113 Austrian and foreign museums and schools. Several years later he again went to Africa with the purpose of proceeding from Cape Town straight across the continent to Cairo. The troubles in the Sudan, however, made this plan impossible and confined his work to southern Africa. In 1887 he returned to Europe with 13,000 objects, which he again distributed to schools and museums. He published many books and lectures—"Sieben Jahre in Südoffike," "Die Kolonisation Afrikas," "Von Kapstact in's Land der Mashukulumbe," etc., etc.

Photographic films may now be developed in a small apparatus or box about the size of a camera without recourse to a dark room and by a process wonderful in its simplicity. This new and important addition to photography is the result of several years of careful experiment and research by Mr. Arthur W. McCurdy, of Washington, D. C.

The first automobile to cross the great mountain range of the Caucasus, by way of the Georgian Military Road and the Dariel Pass, has recently carried from Vladikavkaz to Tiflis the present Minister of Ways and Communications, Prince Hilkof. The behavior of the automobile, says the Russian *Terek Messenger*, was in every way satisfactory, and even on steep descents, with sharp curves, where travel with horses is sufficiently terrifying, the vehicle maintained a speed of twelve miles an hour, without the least jerking or jolting. "This achievement," the *Messenger* says, "proves that automobiles may be used, not only on the great Cau-

casian road" (which goes to a height of more than 8,000 feet), "but upon Russian roads of all sorts."

Dr. C. Willard Hayes has been appointed "geologist in charge of geology" in the U. S. Geological Survey. The duties of the office make Dr. Hayes the administrative head of the geologic work of the Survey, leaving the more immediate scientific direction to the chiefs of the different divisions in geology.

NATIONAL GEOGRAPHIC SOCIETY

MEETINGS OF THE SOCIETY:

March 21, 1902.—President Graham Bell in the chair. Mr. Robert Dunn, of New York, gave an address describing his explorations of the Wrangell group of mountains in Alaska in 1900.

Lieut. H. T. Allen, 2d U. S. Infantry, the first explorer of the Copper River Valley (in 1885), mapped five mountains over 12,000 feet high in the Wrangell group east of the river: Mt. Wrangell, Mt. Tillman, Mt. Sanford, Mt. Dunn, and Mt. Blackburn. Prospectors and others who first entered the valley thereafter in 1898 could, in several instances, locate only four such mountains. Up to the present year no attempt has been made to map the Wrangell group accurately. The mountain apparently missing was the "Mt. Tillman, 16,600 ft.," o Allen's map, the most southwestern of the whole group, which he mapped in the form of an ellipse.

When Mr. Dunn visited the slopes of Mt. Wrangell (17,500 feet) in 1900, various stories were current about this "Mt. Tillman." Some men denied and some affirmed its existence, and it was plain that the matter could not be settled without a trip to the spot on the map where Allen placed "Mt. Tillman." "For instance, Schrader in 1898 accepted its existence," said the speaker. "Lieutenant Babcock, 8th U. S. Cavalry, who was in the Copper River Valley in 1900, believed that Allen, on seeing Mt. Wrangell from two parts of the valley at different times, had reduplicated Wrangell. The clearness of the air, the amount of glaciated country in the valley, and the oval grouping of the peaks contributed to the confusion."

On August 12, 1900, Mr. Dunn made camp where, according to Allen's map, the northern slopes of his "Mt. Tillman" should have been; but south of him for thirty miles, until the coast mountains were reached, the country was absolutely flat. The mountain, where mapped, did not exist. The explanation of Allen's mistake then seemed to be that of Lieutenant Babcock and others.

Two days later, however, he camped between Mt. Wrangell and Mt. Dunn. According to compass observations, this point lay on a northeast-southwest line between a Mt. Sanford of Allen's map and its "Mt. Tillman." In line also with this point was that to the southwest, on Copper River, from which Allen, in his report, had drawn an outline of the Wrangell group as it appeared to him to lie against the horizon and undoubtedly made the observations which formed a basis for his map. From Mr. Dunn's camp, however, the sky-line of Mt. Sanford was identical with that drawn for Mt. Tillman on the outline. Mr. Dunn saw the Mt. Sanford of the map at exactly the same angle as Allen did, only he was much nearer to it. "Mt. Tillman" of the map having been proved non-existent, it was plain that Allen had confused Sanford and Tillman, not Wrangell and Tillman.

"The mistake in mapping could not have arisen," said Mr. Dunn, "if Allen had seen the group only from this point of view. A study of his itinerary clears the matter up, with the following explanation: Allen *outlined* the five mountains as if he saw them in a straight northwest-southeast line; he *mapped* them in an ellipse. In the outline Mt. Sanford appears as a minor peak of Mt. Dunn, northeast of Dunn and of the outlined Mt. Tillman (Mt. Sanford of the map)."

At the conclusion of Mr. Dunn's address, the President called for remarks from the members present.

Dr. William H. Dall referred to the fact that Lieutenant Allen had been the first American to get sight of the great peaks of the Copper River district. The first account of Mount Wrangell was by a Russian party under Branicoff, which went up the Copper River a little distance. The party aroused the enmity of the Indians, and every man was massacred. The

Indians, however, returned the note books to the Russian post. No exploration by Americans was done until the Alaska purchase. Lieutenant Allen deserved great credit for his persevering work, which was carried on with the greatest difficulty.

Mr. Marcus Baker stated that he enjoyed the lecture immensely, and especially commended the photographs which Mr. Dunn showed. He also wished to emphasize the magnificent work done by Allen, who was the first white man to cross from the coast to the river.

Mr. Alfred H. Brooks, who has general charge of the Alaska work carried on by the Geological Survey, stated that the peaks of the Wrangell group had not yet been mapped, and that very little had been learned since Allen's time. A party from the Geological Survey was to locate these peaks during the present summer. Mr. Brooks also alluded to the fact that Mr. Oscar Roan reported in '99 that one of the five peaks of the Wrangell group was missing.

The proceedings of the meetings of the Society on April 4 and 18 will be published in the June number of this Magazine.

LECTURES:

March 25.—Vice-President McGee in the chair. Afternoon course.

Dr. Charles H. Townsend gave an illustrated address on the "Problems of the Pacific—The Lesser Islands."

March 28.—Vice-President McGee in the chair.

Col. Wm. M. Black, Corps of Engineers, gave an illustrated address on "Cuba and Porto Rico."

April 2.—President Graham Bell in the chair. Afternoon course.

Hon. O. P. Austin gave an illustrated address on the "Problems of the Pacific—The Commerce of the Pacific," which will be published later.

April 9.—Vice-President McGee in the chair. Afternoon course.

Dr. McGee gave an address on the "Problems of the Pacific—The great Ocean in World Growth," which will be published later.

April 11.—Vice-President McGee in the chair.

Mr. C. E. Borchgrevink, Commander of the Borchgrevink Antarctic Expedition of 1898–1900, gave an illustrated lecture on "Antarctic Explorations, 1898–1900," which will be published later.

April 25.—President Graham Bell in the chair.

Mr. Robert M. Chapman, of the U. S. Geological Survey, gave an illustrated address on "Our Northern Rockies," which will be published later.

NOTICE OF PROPOSED AMENDMENTS

TO THE

BY-LAWS OF THE NATIONAL GEOGRAPHIC SOCIETY.

THE following amendments to the By-Laws of the National Geographic Society have been duly proposed, have been considered by the Board of Managers, and will come up for action at the regular meeting, to be held in the Assembly Hall of the Cosmos Club, on Friday evening, May 16, with the recommendation of the Board that they be adopted:

ARTICLE III.—*Membership.*

SECTION 1. Change to read: *The Society shall consist of members, honorary members, fellows, and patrons.*

SEC. 4. New section: *Fellows shall be persons engaged in scientific work pertaining to geography; they shall be members of the corporation.*

SEC. 5. New section: *Patrons shall be persons interested in geography who have contributed one thousand dollars or more to the objects of the Society; they shall be entitled to all the privileges of membership for life.*

SEC. 6. Substitute for old section 4: *The election of members, honorary members, fellows, and patrons shall be entrusted to the Board of Managers.*

ARTICLE IV.—*Officers.*

SECTION 1. After the word "members," in each of the first two clauses, insert the words *or fellows.*

ARTICLE VI.—*Finances.*

SEC. 3. New section: *Fellows shall pay an iniation fee of ten dollars on notice of election.*

SEC. 4. Substitute for old section 3: *Annual dues may be commuted for life by members or fellows on the payment at one time of fifty dollars.*

SEC. 5. Old section 4 changed by inserting after the word "members," in both the first and second clauses, the words *or fellows.*

SEC. 6. Old section 5.

ARTICLE VII.—*Meetings.*

SEC. 4. After the word "members" in the second clause insert the words *and fellows.*

Announcement of an Important Work

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